TOPIC WISE NOTES

Topic: Notified Diseases

Disease connected with mining operation, notified in the official gazette of Central Govt. are called notified disease.

This provision is given in sub section (1) of Section 25 of Mines Act 1952 and Regulation 9 of CMR 2017.

If a mine worker contracts a Notified disease the owner, agent or manager of the mine must give notice in form 5 of CMR 2017 within 3 days to

- Chief Inspector of Mines (CIM),
- Regional Inspector of Mines (RIM),
- Inspector of Mines (Medical)
- District Magistrate (DM) and
- Competent Authority for payment of compensation.

There are total 8 notified disease till date.

Notified Disease & Date of notification

Notified Disease	Date of notification
a. Pneumoconiosis	21.07.52
b. Silicosis	21.07.52
c. Manganese Poisoning (Nervous type)	18.12.56
d. Asbestosis	26.06.86
e. Cancer of lungs or stomach or the pleura and peritoneum	26.06.86
f. Noise Induced Hearing Loss	21.02.11
g. Contact Dermatitis caused by direct contact with chemicals	21.02.11
f. Pathological manifestation due to radium or radioactive substance	21.02.11

Cause of Notified Disease

Sr. No.	Notified Disease	Cause
1	Pneumoconiosis	Lung disease caused by inhalation of coal dust among workers employed in coal mines
2	Silicosis	Lung disease caused by inhalation of airborne dust of silica in the crystalline form also known as quartz

Sr. No.	Notified Disease	Cause
3	Manganese Poisoning (Nervous type)	Long term exposure to manganese dust can develop nervous type of manganese poisoning characterized by muscular rigidity causing inability to walk properly and other neurological symptoms.
4	Asbestosis	Lung disease caused due to inhalation of asbestos fibers dust.
5	Cancer of lungs or stomach or thepleura and peritoneum	Exposure to asbestos fibers dust and other carcino-gens.
6	Noise Induced Hearing Loss	Permanent loss of hearing caused by long term exposure to high levels of noise which develops over the years
7	Contact Dermatitis	Contact dermatitis caused by direct contact with chemicals
8	Pathological manifestations	Long term exposure to radioactive substances can cause cancers and genetic disorders.

Topic: Reserve Stations

The place in underground where the explosive is stored is called reserve station.

Reserve station under the provisions of Reg.189 of the CMR 2017, are meant for keeping securely locked explosive canisters issued to a shotfirer for use during the shift.

No case or container containing explosives shall be left or kept in a mine except in a place appointed by the manager for the purpose and legibly marked "RESERVE STATION".

The reserve stations should be so sited that:

1. The place has no overhanging sides or prominent undercuts. The roof is adequately supported, and the place is kept white-washed.

2. The place is kept clean, is free from loose debris, and is adequately fenced.

3. The reserve station and all places lying within 18m of the same are cleaned of coal dust, and the roof, floor and sides in the area are adequately treated with approved type of stone dust.

The floor of the workings in the 18m zone should be particularly treated with at least 2 cm thick layer of stone dust.

4. No energies electric cables are allowed to pass within the distance of 90 meters from the reserve station.

Topic: Quality of Stone Dust

1. Easily dispersible to form a cloud in the air when distributed
2. It should not cake *i.e* should not be hygroscopic,
3. Preferably light in colour so that it easier to detect deposition of a thin surface layer of coal dust
4. Easily available in large quantity and easily grindable.
5. Free silica in stone dust is not more than 5%
6. The stone dust should preferably be water-proofed in humid and wet conditions.

Topic: Stone Dust Barrier

Stone Dust barrier are provided to prevent an explosion extending from one part of the mine to other.

Stone Dust barrier is a device uses the dynamic pressure of explosion to release and disperse a mass of stone dust in the form of thick cloud into the path of an oncoming explosion flame thereby smothering the flame.

Stone dust barrier is required in

- gassy seam of the second or third degree
- in the development workings in a gassy seam of the first degree in which there is likelihood of occurrence of inflammable gas in dangerous quantities.

In case of stone dust barrier

- Type approved by the Chief Inspector
- Chief Inspector may permit in any mine or part there of alternative precautionary measures to be taken in lieu of stone dust barriers.
- If any dispute arises as to whether stone dust barriers or other alternative precautionary measures are required to be provided in any part of a gassy seam of the first degree, the question shall be referred to the Chief Inspector.

Type of stone dust barrier

a. German type

b. Polish type

DGMS recommends adoption of polish type of stone dust barrier.

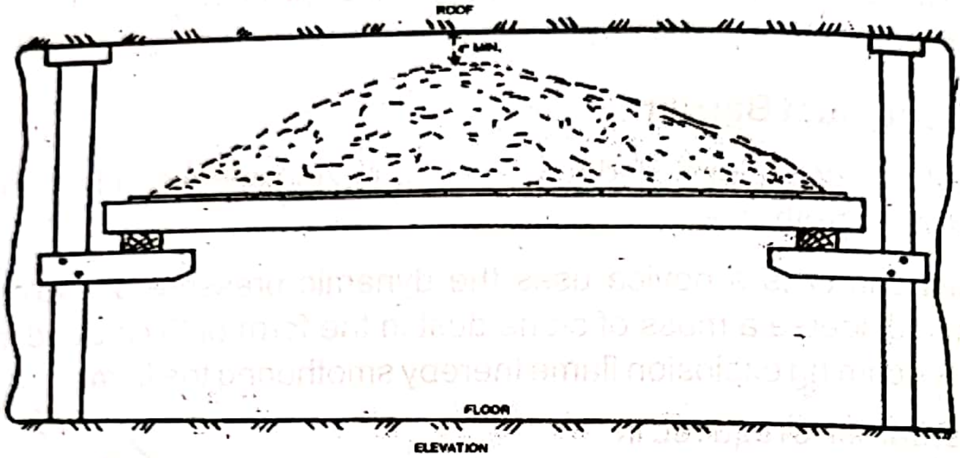
According to loading of the shelves and the total quantity of stone dust on the shelves the barrier may be

i. Light Barrier or Primary barrier

ii. Heavy barrier or Secondary barrier

Construction and design

The stone dust shall rest on boards which run longitudinally in the roadway and whose length equals the width of the shelves. These boards shall rest on a rigid frame, the two members of which shall be at-least 15 cms. in depth and rest on their edge on two fixed rigid brackets. Neither the boards nor the frame shall be fastened either to each other or to the fixed bracket



Specifications of stone dust barrier

Sr. No.	Item	Light barrier	Heavy barrier
1	Plank Width	15cm	15cm
2	Plank Length / Shelves	35cm	50cm
3	Frame Member	15 cm	15 cm
4	Distance between two selves (between heavily loaded shelves or between a heavily loaded shelf and a lightly loaded shelf)	0.9 to 2.0 m	1.25 to 2.7 m
5	Dust required (Kg/cm^2)	110 Kg/m^2	390 Kg/m^2
6	Dust loading on shelf (kg/m)	30 kg/m	60 kg/m
7	Application	Longwall Working	Bord and Pillar & Longwall

Sr. No.	Item	Light barrier	Heavy barrier
8	Distance from face	-- 45 to 110 m in Longwall	135 to 365 m in Bord & Pillar 180-320 m in Longwall 90-150 m in Shaft inset in roads adjacent to the shaft landings in each seam

- Stone dust shall not be less than 10cm from the roof or sides of the roadway or anyroadway support.

- In Bord and Pillar working, only a heavy type barrier may be provided. Heavy barrier shall be provided in all the entries of the district

- Ventilation officer (V.O) ensure proper construction and maintenance (repair, supervise erection of new barriers, write report and countersigned by manager) of barrier.

- V.O examine the stone dust barrier once atleast in every week

- In the bound page book maintained for inspection of stone dust shallalso be recorded all data concerning position, quantity of stone dust, cross section of the road, date of inspection and renewal of stone dust and anyother relevant particulars.

Topic: Noise Level Standards

A. Ambient Noise Standards (ambient standards)

As per the Noise pollution (Regulation and Control) rules,

Area Code	Category of Area	Limits in dB(A)Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Area	50	40

Note1: Day time shall mean from 6.00 am to 10.00 pm
Note 2: Night time shall mean from 10.00 p.m. to 6:00 am.
Note 3: Silence zone is an area comprising not less than 100 meters around Hospitals, Educational institutes and Courts religious place or any other area

which is declared as such by the competent authority

Note 4: Mixed categories of areas should be declared as "one of the four above mentioned categories by the competent authority

B. Noise Standards as per DGMS Circular

Sr. No.	Standards	Noise Levels
1	Warning limit	85 dB(A)
2	Danger limit	90 dB(A)
3	A worker should not be allowed to enter, without appropriate ear protection	115 dB(A)
4	Worker shall not be allowed to enter an area	⩾140 dB(A)

Topic: Standard of Ventilation

1. Purpose

The O, A or M of every mine to take steps to constantly provide adequate ventilation in all parts of the mine belowground which are not sealed off, which may be harmful to the health of persons.

a. to clear away smoke, steam and dust,

b. to dilute gases that are inflammable or noxious so as to render them harmless,

c. to provide air containing sufficient oxygen and

d. to prevent such excessive rise of temperature or humidity

2. O, A or M shall ensure that-

a. in every ventilating district,

- not less than 6 m^3/min of air per person employed on the largest shift or

- not less than 2.5 m^3/min of air per tonne of daily output,

whichever is larger, passes along the last ventilation connection in the district

b. Air does not contain

- less than 19 per cent. of oxygen

- or more than 0.5 percent of carbon dioxide

- or any noxious gas in quantity likely to affect the health of any person;

c. The percentage of inflammable gas does not exceed

- 0.75 in the general body of the return air of any ventilating district and
- 1.25 in any place in the mine;

d. The wet bulb temperature (WBT) in any working place does not exceed 33.5°C, and where the WBT exceeds 30.5°C, arrangements are made to ventilate with a air velocity of not less than 1 m/sec.

e. Air samples and temperature readings shall be taken at least once in every 30 days and the results shall be recorded in a bound paged book.

3. In every mine, ventilation shall be produced by a suitable mechanical ventilator.

4. If in any mine or part thereof the Regional Inspector may permit the requirement the installation and maintenance of such mechanical ventilator as is capable of producing adequate ventilation.

CMR 156 (8) requires that quantity of air to be measured in non-fiery seam and gassy seam of first degree in once every 30 days while air quantity measurement in gassy seam of second degree and third degree are required to be conducted once at least in every 14 days.

Under regulation 169(2) of CMR 2017, the Regional Inspector of mines may require the mine management to take measurements of temperature, humidity and other environmental conditions as may be specified once at least in every 30 days.

Topic: Minimum and Maximum Air Velocity

A. Velocity of Air Current (CMR 2017)

Degree of gassiness	Place where velocity of air is to be measured	Velocity of air (m/min)
First /Second or Third degree	Immediate outbye ventilation connection from theface.	30
First or Second degree	(i) 4.5 metres from any face whether working or discontinued on the intake side of the brattice or partition	30
	(ii) 7.5 metres outbye of the discharge end of an air pipe	15
	(iii) at the maximum span of along wall face.	60

Degree of gassiness	Place where velocity of air is to be measured	Velocity of air (m/min)
Third degree	(i) 4.5 metres from any face whether working or discontinued on the intake side of the brattice or partition	45
	(ii) 7.5 metres outbye of the discharge end of an air pipe	25
	(iii) at the maximum span of along wall face.	75

B. Maximum air velocity (DGMS Circular)

Locality	Maximum Velocity (m/sec)	Maximum Velocity (m/min)
Ventilation shafts not provided with winding equipment, fan drifts	15 m/sec	900 m/min
Ventilation shafts where man-winding is not carried out, or hoisting, shafts only	12 m/sec	720 m/min
Shafts used for man-winding or man-hoisting shafts and haulage roads (other than Conveyor roads)	8 m/sec	480 m/min
Other roadways	6 m/sec	360 m/min
Conveyor roads, loading points and transfer points	4 m/sec	240 m/min
Working faces in developing or depillaring/stoping areas including longwall faces	4 m/sec	240 m/min

Topic: Dust sampling methods and its instrument

Method	Instrument
Filtration	Gravimetric Dust Sampler (MRE 113A)
Thermal Precipitation	Thermal Precipitator
ElectricalPrecipitation	Electrical Precipitator
Impingement (Inertia Precipitation)	Konimeter,Midjet Impinger
Optical method	SIMSLIN, Tyndallascope

Topic: Standard of Illumination

A. Standard of Illumination in Opencast Coal Mines

Sr. No	Place /area to be illuminated	Minimum Standard of illumination (LUX)
1	Work place of heavy machinery	15H, 25V (Cover depth and height through which machine operates)
2	Drilling Operation (i) Area where drilling rig works (ii) Area where drilling holes exists	 25 V 15 H
3	Place where manual work is done	15 H, 25 V
4	Place where loading, unloading or transfer loading of dumper or train is carried out (including OB dump and coal Stack yard)	15 H, 15 V
5	Operator's cabin of machines or mechanism	50 H (at all place of operation)
6	Haul roads for Truck and Dumpers	10 H
7	Rail haulage tracks in the pit	10 H
8	Roadway paths from bench to bench	10 H
9	Permanent path for use of persons employed	10 H
10	Inpit crusher / Feeder breaker	40 H
11	Hand Picking point	50 H
12	Conveyors (i) Transfer point and drive /tail end area (ii) Along conveyor	 40 H 20 H
13	Coal Handling Plant (i) Places of crushing, screening, segregation and loading /unloading (ii) Operation points (iii) Other places (in general)	40 H 50 H 20 H
14	Pumping Station	40H
15	(i) Electrical Substation (ii) Other places of operation of electrical apparatus / equipment	100 H, 50 V 20 H, 20 V
16	First Aid station	50 H
17	Rest Shelter	30 H

Sr. No	Place /area to be illuminated	Minimum Standard of illumination (LUX)
18	Worksop	100 H, 50 V
19	Parking yard	50 H
20	General Working areas as described by the manager in writing	10 H (at the level of surface to be illuminated)

B. Standard of Illumination in Underground Mines

Sr. No	Place /area to be illuminated	Minimum Standard of illumination (LUX)
1	At every shaft landing and shaft bottom or siding which is in regular use	50 H
2	Travelling roadway & Haulage roadway,including Man-riding roadway and every incline in use	10 H, 10V
3	Haulage Roadway (junction) at which tubs are coupled and uncoupled	30 H
4	At every place of loading and unloading	30 H, 20 V
5	At every room and place containing any engine, motor or other apparatus in regular use	30 H
6	Any working face and Goaf Edges of depillaring panels	20 H, 30 V
7	Ladder way Manway	15 H
8	Pumping Station	30H
9	Area under filling / stowing	10 H
10	Conveyors (i) Transfer point and drive /tail end area (ii) Along conveyor	40 H 20 H
11	Hand Picking point	50 H
12	Loco Charging station	50 H
13	Underground garage / Workshop	50 H
14	(i) Electrical Substation (ii) Other places of operation of electrical apparatus / equipment	100 H, 50 V 20 H, 20 V
15	First Aid station	50 H
16	Miners Station / Rest shelter	25 H

Sr. No	Place /area to be illuminated	Minimum Standard of illumination (LUX)
17	Coal Handling Plant (i) Places of crushing, screening, segregation and loading /unloading (ii) Operation points (iii) Other places (in general)	40 H 50 H 20 H
19	Workshop at surface	100 H, 50 V
20	General Working areas as described by the manager in writing	10 H (at the level of surface to be illuminated)

Note H= Horizontal, V= Vertical

Topic: Velocity of detonation (VOD) of different explosive

Velocity of detonation : The rate at which the detonation wave passes through column of explosive

Explosive / Explosive Accessories	VOD
Permitted Explosive	2500-5000 m/s
Emulsion Explosive	5000-6000m/s
Slurry Explosive	3300m/s
ANFO	3500 m/s
Primer (Booster)	7000 m/s
Detonating fuse	6500 m/s
OCG	6000 m/s
NONEL	2000 m/s
Safety fuse	100-120 sec/m

Topic: Maximum shots fired by a Shotfirer

Underground coal mines

DegreeI gassy mines	- 50 shots with single-shot exploder and - 100 shots with multi shot exploder
Degree II &III gassy mines	- 40 shots with single-shot and - 80 shots with multi shot exploders.

-If a mining sirdar or over man is working as a shotfirer also and has more than 30 persons working under his charge, he can fire not more than half the number stated above.

Opencast mines

- 60 shots with single-shot exploder or with ordinary detonators
- 120 shots with multi-shot exploder.

Topic: Maximum permissible charge in U/G coal mines.

Type of explosives	Degree of gassiness / Type of application	Max. permissible charge per shot-hole, (grams)
P_1	Degree 1 mines, cut face	800
P_3	Degree 1, II & III, cut face	1000
P_5	Degree I- 'BOS'	1000
P_5	Degree II & III-'BOS'	565

* BOS = Blasting of the solid

Topic: Rock Mass rating (RMR)

RMR stands for 'Rock Mass Rating'. It is geomechanics classification of roof rock,adopted in coal mines. It plays important role in design and selection of support system. RMR can be calculated on the basis of five parameter and rating of these parameter is given below.

CMRI - RMR Classification

Parameter	Maximum rating
Layer thickness	30
Structural feature	25
Rock weatherability	20
Strength of the rock	15
Ground water seepage	10

The five parameter values should be determined individually for all rock types in the roof upto a height of at least 2m.

Each layer of mass shall be listed and rating on these five parameters shall be allotted, then RMR shall be obtained by the adding the result of these parameters. If there are more than one rock layer then the combined RMR can be calculated as

$$\text{Combined RMR} = \frac{\Sigma \text{ RMR of each bed} * \text{bed thickness}}{\Sigma \text{Thickness of total bed}}$$

The combined RMR may be adjusted to account for some special situations in the mine like great depth, stresses method of work and gallery span.

On final RMR, Roof is classified as follows: -

RMR	Roof Class	Roof description
0-20	V	Very Poor
21-40	IV	Poor
41-60	III	Fair
61-80	II	Good
81-100	I	Very Good

Higher the RMR, better is the roof.

Calculation of rock load -

Rock load (tonnes/m^2) =Span x mean rock density x 1.7- 0.037 x RMR + 0.0002RMR^2)

$$\text{Support resistance} = \frac{\text{no of bolts x bearing capacity of bolts}}{\text{row spacing x gallery width}}$$

$$\text{Safetyfactor} = \frac{\text{support load}}{\text{rock load}}$$

Topic: Rock Quality Designation (RQD)

Rock Quality Designation (RQD) is a measure of quality of rock core taken from a borehole. RQD signifies the degree of jointing or fracture in a rock mass measured in percentage.

RQD is calculated by taking a rock core sample from a borehole and lengths of all sound rock pieces which are minimum 100 mm long (or 10 cm) are summed up and are divided by the length of the core run.

It is proposed by Deere in 1963

$$\text{RQD} = \frac{\text{Sum of length of core piece} \geqslant 10 \text{ cm}}{\text{Total length of core}} * 100$$

Rock quality and their RQD

Rock Quality	RQD (%)
Very poor	<25%
Poor	25 to 50%
Fair	51 to 75%
Good	76 to 90%
Excellent	91 to 100%

Topic: Methane measuring instrument and its principle

Methane Measuring Instrument	Principle
a. FSL	Height of Gas Cap
b. Methanometer	Wheatstone bridge
c. Ringrose firedamp detector	Detector-Diffusion-Combustion- Contraction
d. Inferometer	Difference in refractive index of Pure Methane

Topic: Instrument and its application

Instrument	Application
Barometer	: Atmospheric pressure
Fortein Barometer	: Scientific work accurate atmospheric calculation
Hygrometer	: Relative Humidity
Whirling Hygrometer	: Relative Humidity, rotates at 200 rpm, LC: 0.5°C
Assmann Psychrometer	: Precise dry and wet bulb temp (Relative humidity and Dew point temp.), LC: 0.2°C
Kata thermometer	: Temperature, air velocity, relative Humidity
Manometer	: Differential velocity, gauge Velocity
Inclined manometer	: For less than 50 mm of water gauge
Pitot tube	: Static pressure, velocity pressure/total pressure
Anemometer	: Air velocities, 60-1000m/min
Velometer	: Air velocities
Smoke generators	: Low air velocities

Note : LC = Least count

Topic : Availability and Utilisation of HEMM

$$\text{Availability \%} = \frac{\text{Worked Hour} + \text{Idle Hour}}{\text{Total Shift Hour}} \times 100$$

$$\text{Availability \%} = \frac{\text{Worked Hour} + \text{Idle Hour}}{\text{Worked Hour} + \text{Idle Hour} + \text{B/ D Hour} + \text{Maintenance Hour}} \times 100$$

$$\text{Utilisation \%} = \frac{\text{Worked Hour}}{\text{Total Shift Hour}} \times 100$$

$$\text{Utilisation \%} = \frac{\text{Worked Hour}}{\text{Worked Hour} + \text{Idle Hour} + \text{B/ D Hour} + \text{Maintenance Hour}} \times 100$$

Topic: Norms for Availability and Utilisation

HEMM	CMPDIL Norms		International Norms	
	Availability %	Utilisation %	Availability %	Utilisation %
Dragline	85	73	85	72.25
El. Shovel	80	58	80	68
Hydraulic Excavator	80	61	80	61
Rear Dumper (Mech.)	67	50	80	68
Rear Dumper (El.)	72	54	80	-
Dozer	70	45	-	-
Drill	78	40	-	-

Topic: Voltage in Mines

Colliery Incoming Voltage	11 KV
Usable Voltage	6.6 KV
Hand held portable apparatus	125V
Lighting	125 V in UG 250 V in OC
Portable hand lamp	30 V
Remote control Circuit	30 V
Portable Transportable Voltage	650V
Signalling	30 V
Earthing provision	>30 V
Intrinsically safe apparatus	24 V DC or 15 V AC

Topic: General requirement of mine plan

1. Every plan or section shall-

   a.The name of the mine and name of the owner and the purpose of the plan.

   b. show the true north, or the magnetic meridian and the date.

   c. specify a scale of the plan at least 25 cm long and suitably subdivided.

   d. be on a scale having a R.F. of 2000:1 or 1000:1:

   Chief Inspector may, permit or require the plans to be prepared on any other suitable scale;

   e. be properly inked in on durable paper, tracing cloth or on polyester film (of 125 micro gauge) and be kept in good condition;

   f. an abstract of all statutory restrictions.

2. The conventions shown in the Schedule of CMR 2017 shall be used in preparing all plans and sections.

3. The plans and sections shall be accurate within such limits of error as the Chief Inspector may specify.

4. The plans and sections required by these regulations shall be maintained corrected up-to-date which is not earlier than 3 months.

   - The plan and section shall be brought up-to-datebefore such abandonment, closure or at the time of discontinuance or rendered inaccessible,

   - If such abandonment, closure or discontinuance has been caused by circumstances beyond the control of the O, A or M in which case the fact that the plan or section is not up-to-date shall be recorded on it.

5. All the reference stations at surface and the reference points of underground surveys shall be shown in their correct position relative to the survey of India national grid within the limits of error of survey and plotting,

6. Plans and sections required to be maintained under these regulations shall be kept available for inspection in the mine office and shall not be removed therefrom except with permission of the Regional Inspector, unless a true copy has been kept in the office.

7. The Chief Inspector may permit preparation of plans or sections in variance with the provisions of this regulation.

Geological plan → 5000 : 1

Topic: Types of Plans and its content.

Type of plans	Content of Plan
Surface Plan	showing every surface feature within the boundaries, such as telephone, telegraph or power transmission line, water main, tramline, railway, road, river, watercourse, reservoir, tank, bore hole, shaft and incline opening, opencast working, subsidence and building on the surface.
Underground Plan	i. the position of the workings of the mine belowground; ii. every bore-hole and shaft with depth, incline opening, cross-measure drift, goaf, firestopping or seal, water-dam pumping station and haulage roadway iii. every important surface feature within the boundaries, within 200 meters of the workings. iv. the general direction and rate of dip of the strata; v. seam sections showing any substantial variation in the thickness or character thereof and showing the working section, and such section of the strata sunk or driven through in the mine or proved by boring; vi. the position of every roll, washout, dyke and every fault vii. an abstract of all statutory restrictions viii. Spot levels whenever this plan is brought up-to-date, the position of the workings shall be shown by dotted line drawn through the ends of the working and dotted line shall be marked with the date of the last survey;
Vertical mine section Plan	Where a seam inclination is more than 30 degrees from the horizontal, Vertical mine section or sections are to be prepared showing vertical projection of the mine working as required by RIM. In opencast mine, vertical mine sections showing vertical projections of mine workings at intervals not exceeding 100 m, in both longitudinal as well as transverse directions,irrespective of the inclination of coal seam

Type of plans	Content of Plan
Ventilation Plan	Showing the system of ventilation in the mine, and in particular i. the general direction of air-current ii. every point where the quantity of air is measured iii. every air-crossing, ventilation door, stopping and other ventilation device iv. every fire-stopping and its serial number v. every room used for storing inflammable material vi. the position of fire-fighting equipment vii. every water-dam with details viii. every pumping, telephone and ambulance station ix. every haulage and travelling roadway x. every auxiliary or booster fan xi. every stone dust barrier
Joint survey Plan	A joint survey plan for mines having working within 60 meters of the common boundary or where the boundary is in dispute, within 60 meters of the boundary claimed by the owner of the mine concerned and of the position of the working in relation to one another.
Water Danger Plan	i. nullah, river, lake, water pond, water coarse, drainage or any other water bodies on surface or belowground existing upto 200 meters of the boundary of the mine; ii. the position of the working belowground and every borehole and shaft, drive, cross-cut, staple pit, excavation and air passage connected therewith; iii. the position of every dyke, fault and other geological disturbance. iv. levels taken in workings belowground at easily identifiable points along all drives, main headings and haulage roadways; v. every source of water such as river, stream, water-course, reservoir, water-logged opencast working on the surface, and also the outline of all water-logged workings belowground lying within 60 meters of any part of the workings measured in any direction

Type of plans	Content of Plan
	vi. every reservoir, dam or other structure, either above or belowground, constructed to withstand a pressure of water or to control inrush of water vii. the highest flood level of the area.
Combined UG plan and section	Separate plans and sections for the working of every seam or of every separate section of every seam shall be kept in respect of underground plan, vertical mine section, ventilation plan, joint survey plan. In respect of underground plans, combined plans of all seams or sections, which are lying within 9 meters of each other and which are worked at the mine shall also be kept; and in the combined plans, workings in different seams or sections shall be shown in different colours.

Topic: Summary of Limits of Error

I. Plans

Plotting errors

Plans on the 1/2,000 scale	50 cm
Plans on the 1/1,000 scale	25 cm

II. Surface Surveys

i. *Triangulation*

Position of stations of the triangulation as determined from initial and verification origin.	1/5000th of the linear horizontal distance from local point or bases.

ii. *Traverses*

Total angular error	30/n seconds
Error of closure	1/3000th of the horizontal length of the traverse

III. Underground Surveys

i. *Traverse closed polygonally*

Total angular error	(20+X)/n seconds
Error of closure	1/2500th the horizontal length of the traverse

ii. *Traverse not closed polygonally but closed upon reference points*

Error of closure	1/1500th of horizontal length of the traverse

iii. *Subsidiary Surveys*

Error of closure by plotting	1/500th of horizontal length of the traverse
Difference of two or more determinations of any subsidiary points	3 metres

IV. Correlations

By shaft wires	2 minutes of arc
By magnetic observations	2 minutes of arc
By direct connection	1 minutes of arc

V. Levels

Surface mine bench marks	2 cms per km.
Inset bench marks	Two or more shaft measurements of established inset bench mark should agree within 1/5,000.
Inbye bench marks	1/2500th of the inclined length of the levelling.
Subsidiary points	50 cm

Topic: Moh's Scale of Hardness

Hardness	Name	Chemical Formula
1	Talc	$Mg_3Si_4O_{10}(OH)_2$
2	Gypsum	$CaSO_4 2H_2O$
3	Calcite	$CaCO_3$
4	Fluorite	CaF_2
5	Apatite	$Ca_5(PO_4)_3(OH^-,Cl^-,F^-)$
6	Orthoclase	$KAlSi_3O_8$
7	Quartz	SiO_2
8	Topaz	$Al_2SiO_4(OH^-,F^-)_2$
9	Corundum	Al_2O_3
10	Diamond	C

5/03

Topic: Original rock and Metamorphic rock

Original rock	Metamorphic rock
Sandstone	Quartzite
Shale	Slate, Mica-Shiest
Limestone	marble
Granite	Gneiss
Slate	Schist
Basalt	Amphibolite

Topic: Standards of drill hole diameters and core sizes

The hole sizes in diamond drilling are designated as NX, BX, AX, and EX.

Standard	Hole dia. (mm)	Core dia. (mm)
NX	75	54
BX	60	40
AX	47	28
EX	38	21

Topic: Distance from Shaft, Incline or Outlet

10 meter - Surface structures and supports from all entrances fireproof material

13.5 meter - Shafts, inclines or outlets shall not be less than 13.5 meters distant from one another

15 meter - Inflammable materials shall not be stored from any entrance to a mine

15 meter- No person shall light a fire in any o/c working from any entrance to a mine, except in writing by the manager

80 meter- No screening or sorting of coal, no heap of cinder, cement, sand, other dry and fine material shall be placed from the top of down-cast shaft or intake airway.

Topic: Drilling Pattern

The drilling pattern for blasting in coal / rock is given below:

a. Pyramid cut or Cone cut:Drilling hole at corners of square so as to meet at the back of the round.

In cone cut holes are drilled forming corners of a polygon with centre hole so as to meet at the back of the cut.

b. Wedge cut: Pair of hole drilled incline at an angle of less than 45° towards the centre to form a wedge when blasted. Used in BOS in coal in galleries B&P working

c. Drag cut : used for small drifts, drilling holes at an angle to the cleavage, not favourable for large excavation

d. Fan cut: Fan like pattern, Favourable for laminated strata, mostly soft, not for hard ground

e. Burn cut : Parallel holes at right angles to the face, Effective in hard brittle, homogeneous ground

f. Coromant cut: Parallel holes at right angles to the face, used in tunnel or drift of small area

g. Ring drilling:There are two type of ring drilling one is Vertical ring drilling another is Horizontal ring drilling.

- In vertical ring drilling, rings are drilled in vertical planes like a fan to break to a vertical face.
- In horizontal ring drilling, holes are fanned out radially in horizontal planes to break to a horizontal face.
- This is used in blasting galleries in coal mines and sublevel sloping and shrinkage stoping in metal mines.

Topic: Strength of Pillar

A. CMRI Formula

CMRI developed a formula for pillar strength taking into account the pillar w/h ratio, the uniaxial compressive strength of the pillar, the height of seam and depth of cover.

$$S = (0.27 \times \sigma_c \times h^{-0.36}) + \left\{\frac{H}{250} + 1\right\}\left\{\frac{w}{h} - 1\right\}, MPa$$

Where,

S = Pillar strength (MPa)
σc = Uniaxial compressive strength (UCS) (MPa)
h = Pillar Height, w = Pillar width (m)
H = Depth of cover (m)

B. Bianiawski formula

$$S = \sigma_1\left(0.64 + 0.36\,\frac{w}{h}\right)$$

Where, w & h = Pillar dimension
σ = Strength of cubical specimen

C. Saloman & Munrow formula

$$S = 7180\ W^{0.46} / h^{0.66}\ \text{KN/m}^2$$

Where,

W = width of the pillar (m)

h = height of the pillar (m)

Topic: Distance between the centres of any two adjacent pillars

Depth of seam from surface	Width of the galleries			
	Upto 3.0 m	3.0 m - 3.6 m	3.6 m - 4.2 m	4.2 m - 4.8 m
Upto 60m	12	15	18	19.5
60 m – 90 m	13.5	16.5	19.5	21.0
90 m – 150 m	16.5	19.5	22.5	25.5
150 m – 240 m	22.5	25.5	30.5	34.5
240 m – 360 m	28.5	34.5	39.5	45
greater than 360 m	39	42	45	48

Topic: Rules and Regulations framed under the Mines Act, 1952

Rules/Regulations	Application
1. The Coal Mines Regulations-2017	All Coal mines.
2. The Metalliferous Mines Regulations-1961	All mines other than coal and oil mines.
3. The Oil Mines Regulations-1984	All Oil mines.
4. The Mines Rules-1955	All mines.
5. The Mines Rescue Rules-1985	All belowground mines.
6. The Mines Vocational Training Rules-1966	All mines.
7. The Mines Crèche Rules -1966	All mines.
8. The Coal Mines Pit head bath Rules-1959	All Coal mines employing more than 100 persons.
9. Mysore Gold Mines Rules, 1953	
10. Statutory Orders issued under Mines Act, 1952	

Topic: Conference on Safety in Mines

Safety Conference	Year	Place
Ist Safety Conference	1958-59	Calcutta
IInd Safety Conference	July 1966	Calcutta

IIIrd Safety Conference	July 1973	Calcutta
IVth Safety Conference	Dec. 1978	New Delhi
Vth Safety Conference	Dec 1980	New Delhi
VIth Safety Conference	Jan. 1986	New Delhi
VIIth Safety Conference	Dec. 1988	New Delhi
VIIIth Safety Conference	May 1993	New Delhi
IXth Safety Conference	Feb. 2000	New Delhi
Xth Safety Conference	Nov. 2007	New Delhi
XIth Safety Conference	July 2013	New Delhi

Topic: Forms and Schedule of Rules and Regulations

A. CMR 2017

Form	CMR 2017 Regulations No.	Descriptions
Form 1-A	3	Notice of opening.
Form 1-B	6	Notice of reopening
Form 1-C	5	Notice of closure, abandonment
Form 1-D	5	Notice of discontinuance
Form 2-A	7	Notice of change in name of mine
Form 2-B	7	Notice of change in ownership of mine
Form 2-C	7	Notice of change in address of O,A or M of mine
Form 2-D	7	Notice of appointment of agent, manager etc.
Form 2-E	7	Notice of termination of agent, manager etc.
Form 3	4	Annual Return
Form 4-A	8	Notice of Accident / Dangerous Occurrence
Form 4-B	8	Particulars of Deceased/Injured person
Form 4-C	8	Particulars of Injured person returning to duty
Form 5	9	Notice of Disease notified under section 25 of the Mines Act
Form 6	117	Pointing out the contraventions during inspections
Form 7	28	Managers Charge Report

B. Mines Rule 1955

Schedule	Form	Rule No.	Descriptions
First Schedules	Form A	48 (1)	Notice of commencement and end of work
	Form A	48(3), 51, 77 and 77A(2)	Details of person employed in the mine.
	Form B	48(3) and 78	Register of persons employed below ground
	Form D	48(3) and 78	Register of persons employed above ground opencast working
	Form D	48(3) and 78	Register of persons employed above ground
	Form E	Rule 49(4)	Register of Compensatory Days of Rest.
	Form E	Rules 53	Register of Leave Account during the Calendar Year
	~~Form H~~	~~Rules 53~~	~~Register of Leave Account during the Calendar Year~~
	Form B	Rules 59	Register of Overtime Wages
	Form J	Rule 76 (1)	Return of Reportable accident
	Form K	Rule 76 (2)	Return of Minor Accidents
	Form L	Rule 54	Information regarding leave with Wages
	Form M	Rule 29D(1)	Notice of initial/ periodical medical examination under rule 29B
	Form N	29D (3)	Second and final notice of initial/periodical medical examination
	Form O	29F(2) and 29L	Report of medical examination
	Form P	29F(1) and 29L	Medical Standard of fitness for Persons Employed
	Form P-I	29F(1) and 29L	Medical Standard of fitness for Persons to be Employed
	Form Q	Rule 29J(2)(a)	Notice of medical re-examination by Appellate Medical Board

Schedule	Form	Rule No.	Descriptions
	Form R	Rule 29J(2)(b)	Second and final notice of medical re-examination by Appellate Medical Board
	Form S	Rule 29L	Report of medical re-examination by Appellate Medical Board
	Form T	Rule 29-P(i)	Annual Return for the year ending on the 31st December
	Form U	Rule 29 R &29S	Workmen‟s Inspector Inspection report
Second Schedule		Rule 43 (3)	Equipment of a first-aid Room
Third Schedule		Rule 44(1)	Equipment of a first-aid Station
Fourth Schedule		Rule 50	Exemption from hours and limitation of employment
Fifth Schedule		Rule 79(1)	Abstracts of the Act

Registers required to be maintained in Form B, Form C, Form D, Form E, Form F, Form G, Form H, Form I have been omitted. Only five registers are to be maintained under 'Ease of Compliance to maintain registers under various Labour Laws Rule 2017'

Sr. No.	**Forms earlier maintained under mines rule 1955**	**Corresponding new forms under the 'Ease of Compliance to maintain registers under various Labour Laws Rule 2017'**
1	Form B	Form A
2	Form C, Form D, Form E	Form D
3	Form F	Form E
4	Form G, Form H	Form E
5	Form I	Form B

Ease of Compliance to maintain registers under various Labour Laws Rule 2017

Form A : Format of Employee Register

Form B : Format of Wage register

Form D: Format of Attendance register

Form E : Format of register of Rest/ Leave/ Wage

MVTR – 1966 .

C. Mines Vocational Training Rule (MVTR) 1966

Schedule	Rule No.	Descriptions
First schedule	Rule 6 (1)	Course of Theoretical and Gallery training for surface and opencast workers.
Second schedules	Rule 6 (2) (a)	Course of Theoretical and Gallery training for workers below ground.
Third schedule	Rule 6 (2) (b)	Course of special additional training for entrants to gassy mine.
Fourth schedule	Rule 8 & 10	Course for Refresher Training.
Fifth schedule	Rule (12)	Course of Training for Timber Mistry
Sixth schedule	Rule (13)	Course of Training in the handling and use of explosives.
Seventh schedule	Rule 14	Course of training on Shot-firing
Eighth schedule	Rule 17	Course of Training in Gas-Testing

Form	Rule No.	Descriptions
Form - A	Rule 28 (1)	Certificate of Training for employment in a mine on surface and in opencast working/belowground in non-gassy mine.
Form - B	Rule 28 (1)	Certificate of refresher Training /Training of special categories of workmen.

SCHEDULE –XII

Form - 1	Training centre details
Form- 2	Notice of Training program for ... Batch
Form - 3	Schedule of Training
Form - 4	Trainee Details
Form - 5	Register of Trainee details
Form - 6	Performance Chart for Trainees
Form - 7	Progress Chart of the Training Centre for Quarter
Form - 8	Notice of Opening/ Closing/Re-opening/Change of Name of Training Centre
Form - 9	Particulars of (appointment/termination) of Training officer/ Inspector
Form - A	Certificate of Training

D. Rescue Rule 1985

Form	Rule No.	Descriptions
Form - I	Rule 3 (4)	Intimation of appointment etc. of Superintendent.
Form - II	Rule 11 (7)	Notice of accident

Schedule	Rule No.	Descriptions
First schedule	Rule 11(1)	Equipment to be kept at a Rescue Station
Second schedules	Rule 11(2)	Equipment to be kept at a Rescue Room
Third schedule	Rule 11(3)	Minimum equipment to be kept at the s/f of the mine where no rescue room is located close to mine entrance
Fourth schedule	Rule 11(6)	Adjustment and Test of breathing apparatus, Flowmeter, Bobin meter, Oxymeter etc.
Fifth schedule	Rule 18	Conventions
Sixth schedule	Rule 20 & 22	Medical Examination
Seventh schedule	Rule 2	Course of Instructions & practices Part-I Initial course
Eight schedule	Rule 32(3)-1	Signals

Topic: Welfere Provisions as per Mines Rule

No of Person	Facility to be provided in mines	Description
>= 500	Workmen Inspector	WI in each for Mining, mechani- cal and Electrical discipline
>1500	Additional Workmen Inspector	the WI shall be assisted by one additional WI in mining discipline for every additional 1000 persons or part thereof.

No of Person	Facility to be provided in mines	Description
>100	Safety Committee	For promoting safety in the mine
>=100	Drinking water to be effectively cooled by mechanical means	above ground or in opencast workings.
50	Surface Latrine	More than 50 persons are employed underground
50	Underground Latrine	at least one seat for every 50 males or 50 females in above ground
>150	First-aid room	
>1000	Medical practitioner shall be a whole-time employee in first-aid room	
50 or part there of	First-aid station in every opencast working, and place where 50 persons employed.	
>50 persons	Shelters	Near loading, opencast workings, workshops and mine entrances where 25 or more persons are ordinarily employed, for taking food and rest
>250 persons	Canteen	
>=500	Welfare Officer	>2500 such Welfare Officer shall be assisted by one suitably qualified additional WO for every additional 2000 persons or part thereof.

Topic : Qualification and Appointment of Inspector and Mine Officials

INSPECTORS

Chief Inspector- Degree in mining engg. and First Class Manager's Cert.

Inspector - Degree in mining engg. and First Class Manager's Cert.

Provided –

(i) electrical machinery installed - degree in electrical engineering

(ii) other machinery or mechanical appliances - Degree in mechanical engineering

(iii) health and welfare of persons - Degree in Bachelor of Medicines and Bachelor of Surgery (M.B.B.S.)

MANAGERS

>23 years of age

For belowground mines:	
a. In excess of 2,500 tonnes per month	A First Class Manager's Certificate NROC* only.
b. Not exceeding 2,500 tonnes per month.	A First Class Manager's Certificate or Second Class Manager's Certificate NROC only.
For opencast mines:	
c. In excess of 20,000 cubic metre per months of material handled	A First Class Manager's Certificate.
d. Not exceeding 20,000 cubic metre material handled per month	A First Class Manager's Certificate or Second Class Manager's Certificate

* NROC – Not restricted to Opencast

- No person appointed, as manager of more than one mine (except CI permission) for a period exceeding 12 months

- With the Absence of manager or manager is unable to exercisedaily personal supervision or unable to perform his duties, O,A or M authorise a person to act as manager

(i) such person holds a Manager's Certificate;

(ii) Authorisation shall not have effect for a period in excess of 30 days, except the Chief Inspector previous consent

(iii) O,A or M, shall forthwith send a written notice intimating that such an authorisation to the Regional Inspector and stating the reason for the authorisation, the qualifications and experience of the person authorised, the date of the commencement and ending of the authorisation;

(iv) the Chief Inspector or the Regional Inspector may, by an order in writing, revoke any authority so granted.

- Manager and the under-manager or assistant manager reside within a distance of 5 KM from all mine openings;

SAFETY OFFICERS

- the manager shall be assisted in the work of promoting safe practices in the mine by a Safety Officer
- UG average monthly output of which > 5,000 tonnes
- OC average monthly material handled of which >20,000 Cu.m

For belowground mines: (tonnes per month)	
>15000	First Class Manager's Cert. NROC
10000 -15000	First Class / Second Class Manager'sCert. NROC
5000 - 10000	First Class / Second Class Manager'sCert. NROC / Degree or Diploma
>5000	Safety officer Appointment
For opencast mines: (cubic meter)	
>50000	First Class Manager'sCert
20000-50000	First Class / Second Class Manager'sCert.
>20000	Safety officer Appointment

ASSISTANT MANAGERS

-The manager shall be assisted by assistant managers

Number of Assistant Managers to be appointed

A. Underground mines:

In every mine the average output of which exceeds 7,000 tonnes, the manager shall be assisted by assistant managers on the following scale:

Average output per month	Number of assistant managers
Up to and including 10,000 tonnes	One
Above 10,000 tonnes	One additional assistant manager for every 5,000 tonnes output or part thereof in excess of 10,000 tonnes

Provided that in a mine where the average output exceeds 20,000 tonnes, at least one of the assistant managers shall hold a First Class Manager's Certificate.

B. Opencast mines:

In every mine, the manager shall be assisted by assistant managers on the following scale:

Average material handled	Number of assistant managers
Up to and including 1 million cubic metre	Ten
Above 1 million cubic metre	One additional assistant manager for every 1 million cubic metre of average material handled or part thereof in excess of 1 million cubic metre.

At least 30 % of the assistant managers required in an opencast mine shall be holder of First Class Manager's Certificate.

VENTILATION OFFICER

- The manager shall be assisted in the work of supervising the maintenance of the ventilation system.

Degree I gassy Mine	Degree II & III gassy Mine	Qualification
>5000 TPM	>2500 TPM	VO appointed
5000 – 15000 TPM	2500 – 10000 TPM	Managers certificate NROC / Degree / diploma
>15000 TPM	> 10000 TPM	Managers certificate NROC

- In degree I gassy mine, having output less than 15,000 tonnes, the RIM may combining the post of ventilation officer with safety officer considering the nature and extent of working therein.

ENGINEERS

- General charge of machinery, and to be responsible for its installation, maintenance and safe working of machinery.

-subordinate to manager

Type of the mine	Qualification
Every mine where machinery used	Degree or Diploma in Mech engg. / Electrical Engg. / Mining machinery or equivalent
Where Electrical energy > 650 V & installed capacity of all electrical equipment > 1.5 MVA	Degree/ Diploma in Electrical engg. or eqvt.

Type of the mine	Qualification
OC mine worked by HEMM, or UG mechanized mine in which aggregate HP of all machinery exceeds 1500HP	Degree or Diploma in Mech engg. / Mining machinery or equivalent Hold charge of all mechanical equipment installed

SENIORS OFFICIALS

At every mine, one or more overman shall be appointed to hold charge of the different districts of the mine on each working shift.

SURVEYORS

- holding a Surveyor's Certificate
- for carrying out the surveys and levellings and for preparing the plans and sections required
- For OC mine person holding surveyor certificate restricted to OC mine
- No person appointed as a surveyor of more than one mine or in any other capacity in the same mine except CIM permission.
- If more than one surveyor, each surveyor duties and responsibilities assigned by O, A/M

Number of surveyors required

A. Underground mines:

The number of surveyors required to be appointed shall be on the following scale namely;

Average output	Number of surveyors
8,000 tonnes and below	One
Above 8,000 tonnes	One additional surveyor for every additional 15,000 tonnes or part thereof.

Provided that for calculating the output of the mine only half of the output in the mine obtained from the depillaring operations shall be taken into consideration.

B. Opencast mines:

The number of surveyors required to be appointed shall be on the following scale namely;

Average material handled	Number of surveyors
Up to 1 million cubic metre	Two
Above 1 million m^3 and up to 5 millioncubic metre	Three
Above 5 million cubic metre and up to 10million cubic metre	Four
Above 10 million cubic metre and up to 15million cubic metre	Six
Above 15 million cubic metre	One additional surveyor for every ten million cubic metre of average material handled or part thereof in excess of 15 million cubic metreand that value to be added by a figure of 6 (Six).

WINDING ENGINEMEN (Reg. 76)

- Engine driver certificate

- Electrical Winding Engine upto 30 h.p. or of a steam or compressed air winding engine which has cylinders not exceeding 18 cm in diameter and which is not used for raising or lowering persons - No appointment of Winding Engine man

-The name of the winding engineman on duty, together with the period of his shift shall be posted in the winding engine room.

- If duties of any winding engineman are unduly arduous period of his shift to be reduced to not less than five hours by Regional Inspector.

- In an emergency any other competent person may be permitted to operate the engine.

Topic : Information to be furnished in the plan needed in DGMS

Regulation No	Purpose for which Plans needed to DGMS	Plan should show/ contains
112	Depillaring operations	Proposed extent of extraction or reduction of pillars, the manner in which such extraction or reduction is to be carried out, the thickness and depth of the seam, the nature of the roof, and the rate and direction of dip.
113	Extraction of Coal by method other than bord and pillar system	Upto date plan of the area where such development or extraction is proposed, showing details such as the manner and proposed extent of development or extraction
118	Multi-section and contiguous working	the proposed layout of the workings, section of the seam or seams, the depth of the seams from the surface, the rate and direction of dip, the proposed dimensions of pillars and galleries in each seam or section, and the thickness of the parting between the seams or sections.
119	Working under railways and roads, etc.	the existing and the intended mining operations in so far as they affect the railway or public road or works or building or structure concerned.
149	Danger from Surface water	the existing position of the workings, the proposed layout of workings, the depth of the workings from thesurface, the position and depth of any goaves in every seam in the neighbourhood, all faults, dykes and other geological disturbances and such other particulars

Regulation No	Purpose for which Plans needed to DGMS	Plan should show/ contains
		as may affect the safety of the mine or of the persons employed therein.
150	Danger from underground inundation	(a) the outlines of all such disused or abandoned workings in relation to the working approaching them and also the depth of such disused or abandoned workings from the surface (b) the outlines, the layout and the method of the proposed working for which permission is sought; (c) the faults, dykes and other geological disturbances in relation to workings.
152	Construction of reservoir, water dam, etc.	design and other details of the proposed construction.

- Reg 152 need application to RIM and in all other case application to CIM with plans

Topic: Workmen's Inspector (WI)

1. Where 500 or more persons are ordinarily employed,the O, A or M shall designate 3 suitably qualified employees in consultationwith the registered trade union, as technical experts to carry out inspection of the mine on behalf ofthe workers employed therein,

2. WIs shall be selected

- one from mining discipline,
- one from electrical,
- one from mechanical,

3. If ordinarily employed is more than 1500, the WI shall be assisted by one additional WI in mining discipline for every additional 1000 persons or part.

4. A panel of Workmen's Inspector constituted who may serve as substitute each for mining, electrical and mechanical discipline.

5. Qualification of WI

Mining: Overman's Certificate

Electrical: Electrical Supervisor's Certificate

Mechanical: Status equivalent to Overman, or Electrical Supervisor

6.Experience: At least 5 years of experience in mines including at least 2 years in the same mine.

7.Orientation training: 30 lectures and demonstrations of not less than two hours duration each, in accordance with the syllabus and centre approved by CIM.

8. The WI shall perform the duties for 2 days in every week mentioned in rule 29R.

On remaining days of the week, he shall perform his normal duties

9. A WI hold office for a period of 3 years from the date of his nomination unless he resigns and shall be eligible for one re-nomination.

10.O, A or M shall not take any action against a WI for any of his actions in the discharge of his duties and functions.

11.Facility

a. The O, A or M shall afford the WI all reasonable facilities for making any entry, inspection, measurement, examination or inquiry in connection with his duties.

b. An official of the mine shall accompany the WI during inspection.

c. The Workmen's Inspector may carry out his inspection at any time.

12. When there occurs an accident or dangerous occurrence the O, A or M shall forthwith inform the concerned WI

13. The WI shall not exercise his powers to impede or obstruct the working of the mine.

14. Duties of WI (Rule 29R)

a.To inspect all shafts, inclines, roads, workplaces and the equipment including the equipment for conveyance and transport of workers;

b.In case of any urgent and immediate danger that comes to notice of WI, he shall inform the manager and the Inspector and suggest remedial measures necessary to avoid the danger

c.To accompany the Inspector in his complete inspection of the mine and also during such other inspections as may be considered necessary by the Inspector.

d. The Workmen's Inspector shall record a full report of the matters ascertained as a result of his inspection in an interleaved paged and bound register in the mine in Form U.

15. Action on the report of WI

a. O, A or M shall take action on the report of WI inspection within 15 days from the date of entry in the register..

b. In case of any difference of opinion, the matter shall be sent to CIM or Inspector for decision.

Topic: Safety Committee (SC)

1. Formation

Where more than 100 persons are ordinarily employed, the O, A or M shall form a Safety Committee for promoting safety in the mine.

2. Composition of the Safety Committee

The safety committee shall consist of:

a. Manager who act as Chairman.

b. Five officials or competent person nominated by the Chairman.

c. Five workmen nominated by the largest Trade Union

d. Workmen Inspector

e. Safety officer who work as secretary to the SC.

However, Chairman may co-opt any official or competent person or workperson.

3. Functions of the SC (Rule 29V)

a. To discuss on remedial measures against unsafe conditions and practices as pointed out by WI or otherwise and make appropriate recommendation.

b. To consider the proposed Safety and health measures including related codes of practice and to make appropriate recommendations before

i. Opening of a new district, or

ii. new mechanical or electrical installations.

iii. Introduction of new mining technique.

c. To discuss on accident enquiry report and make appropriate recommendation.

d. To formulation and implementation of proper safety campaign based on analysis of accidents.

e. To meet at least once in 30 days to consider the matters placed before it any other matter raised by the members

d. To serve as a platform for safety and occupational health matters.

4. Implementation of recommendation of the safety committee:

The O, A or M shall within 15 days of the receipt of recommendation of the SC shall indicate to the secretary to the committee for the action taken to implement the recommendation.

Topic: Coal Grades

The gradation of non-coking coal is based on Gross Calorific Value (GCV), the gradation of coking coal is based on ash content and for semi coking /weakly coking coal it is based on ash plus moisture content. As per notification in Ministry of Coal, the two new grades of coking coal is introduced i.e.Washery Grade -V and Washery Grade -VI.

A. Grades of Coking Coal

Sr. No	Grade	Ash Content
1	Steel Grade - I	Not exceeding 15%
2	Steel Grade - II	Exceeding 15% but not exceeding 18%
3	Washery Grade -I	Exceeding 18% but not exceeding 21%
4	Washery Grade -II	Exceeding 21% but not exceeding 24%
5	Washery Grade -III	Exceeding 24% but not exceeding 28%
6	Washery Grade -IV	Exceeding 28% but not exceeding 35%
7	Washery Grade -V	Exceeding 35% but not exceeding 42%
8	Washery Grade -VI	Exceeding 42% but not exceeding 49%

B. Grades of Semi-coking and Weakly Coking Coal

Sr. No	Grade	Ash+Moisture
1	Semi Coking Grade -I	Not exceeding 19%
2	Semi Coking Grade -II	Exceeding 19% but not exceeding 24%

C. Grades of Non-coking Coal

Sr. No.	GCV Bands (Kcal/Kg)	Grade
1	Exceeding 7000	G1
2	Exceeding 6700 and not exceeding 7000	G2
3	Exceeding 6400 and not exceeding 6700	G3
4	Exceeding 6100 and not exceeding 6400	G4
5	Exceeding 5800 and not exceeding 6100	G5
6	Exceeding 5500 and not exceeding 5800	G6
7	Exceeding 5200 and not exceeding 5500	G7
8	Exceeding 4900 and not exceeding 5200	G8
9	Exceeding 4600 and not exceeding 4900	G9
10	Exceeding 4300 and not exceeding 4600	G10
11	Exceeding 4000 and not exceeding 4300	G11
12	Exceeding 3700 and not exceeding 4000	G12
13	Exceeding 3400 and not exceeding 3700	G13
14	Exceeding 3100 and not exceeding 3400	G14
15	Exceeding 2800 and not exceeding 3100	G15
16	Exceeding 2500 and not exceeding 2800	G16
17	Exceeding 2200 and not exceeding 2500	G17

Topic: ABBREVIATION

GIS	Geographical Information System
GPS	Global Positioning System
RQD	Rock Quality Designation
RMR	Rock Mass Rating
CPT	Crossing Point Temperature
ISO	Internal Safety Organisation
SAPICOM	Survey of accident prone and Identification of corrective measures
SOMA	Study of Mine Accident to Plan Preventive Measure
ZAP	Zero Accident Potential
MAP	Minimum Accident Potential
QMP	Qualified Medical Practitioner
MVTR	Mines Vocational Training Rules
CMR	Coal Mines Regulation
MMR	Metalliferous Mines Regulation
MCR	Mine Creche Rule
MCDR	Mineral Conservation and Development Rules
PETN	Penta Erythritol Tetra Nitrate
ASA	Lead azide, Lead Styphnate, Aluminium Powder.
FSL	Flame Safety Lamp
GDS	Gravimetric Dust Sampler
PDS	Personal Dust Sampler
EMP	Environment Management Plan
EIA	Environment Impact Assessment
OMS	Output per Man Shift
VCR	Vertical Creater Retreat
NVP	Natural Ventilation Pressure
SIMSLIN	Safety in Mines Scattering Light Instrument
HEMM	Heavy Earth Moving Machinery
OITDS	Operator Independent Truck Dispatch System
EDM	Electro-magnetic Distance Measuring Instrument

VEQ	Ventilation Efficiency Quotient
GCV	Gross Calorific Value
MART	Multi Access Radio Telephone
PPV	Peak Particle Velocity
DERD	Double Ended Ranging Drum Shearer
SERD	Single Ended Ranging Drum Shearer
LHD	Load Haul Dumper
SDL	Side Discharge Loader
BWE	Bucket Wheel Excavator
AFC	Armoured Face Conveyor
HAC	High Angle Conveyor
IWRC	Independent Wire Rope Core
GPR	Ground Penetrating Radar
GSI	Geological Survey of India
NPV	Net Present Value
ETP	Effluent Treatment Plant
APC	Air Pollution Control
AMP	Abandoned Mine Plan
ANFO	Ammonium Nitrate Fuel Oil
LoX	Liquid Oxygen Explosive
OCG	Opencast Gelatine
CHP	Coal Handling Plant
SCBA	Self Contained Breathing Apparatus
SCRA	Self Contained Rescue Apparatus
MINOS	Mines Operating System
SWL	Safe Working Load
ISPs	Integrated Steel Plants
MIS	Management Information System
MOU	Memorandum of Understanding
OMS	Output Per Man Shift
POL	Petrol Oil and Lubricant

PPD	Production Planning Division
NCWA	National Coal Wage Agreement
HVS	High Volume Sampler
CMM	Coal Mine methane
AMM	Abandoned Mine methane
MDCC	Medium Duty Chain Conveyor
HFL	Highest Flood Level
CIM	Chief Inspector of Mines
RIM	Regional Inspector of Mines
DGMS	Director General of Mine Safety
DDG	Deputy Director General of Mine Safety
DMS	Director of Mine Safety
MAMID	Mine Accident Analysis and Modernization of Information Database
PILSDWA	Paper Insulated, Lead Sheathed, Double Wire Armoured
NEW	Non Effective width
OEM	Original Equipment Manufacturer
SMP	Safety Management Plan
SCAMP	Strata Control and Monitoring Plan
HOE	Hiring of Equipment
AFDSS	Automatic Fire Detection and Suppression System
MDO	Mine Developer Cum Operator

MINING COMPANY

CIL	Coal India Limited (8 Subsidiary)	
SECL	South Eastern Coalfields Limited	Bilaspur
WCL	Western Coalfields Limited	Nagpur
MCL	Mahanadi Coalfields Limited	Sambalpur
ECL	Eastern Coalfields Limited	Asansol
BCCL	Bharat coking coal Limited	Dhanbad
NCL	Northern Coalfields Limited	Singrauli
CCL	Central Coalfields Limited	Ranchi

CMPDI	Central Mine Planning& Design Institute	Ranchi
NECL	North Eastern Coalfields Limited	Guwahati
UCIL	Uranium Corporation of India Limited	
MOIL	Manganese Ore India Limited	
SCCL	Singareni Collieries Company Limited	
KGF	Kolar Gold Field	
NALCO	National Aluminium Company Limited	
BALCO	Bharat Aluminium Company Limited	
NMDC	National Mineral Development Corporation	
HZL	Hindustan Zinc Limited	
NIRM	National Institute of Rock Mechanics	
CIMFR	Central Institute of Mining and Fuel Research	
	(Previously known as CMRI- Central Mining Research Institute)	
IBM	Indian Bureau of Mines	
MGMI	Mining Geological & Metallurgical Institute	
MECL	Mineral Exploration Corporation Limited	
KIOCL	Kudramukh Iron Ore Company limited	
IREL	Indian Rare Earth limited	
SAIL	Steel Authority of India Limited	
RINL	Rashtriya Ispat Nigam Limited	
HCL	Hindustan Copper Limited	
TISCO	Tata Iron and Steel Company Limited	
IISCO	Indian Iron and Steel Company Limited	
OMC Ltd	Odisha Mining Corporation Limited	
RSMML	Rajasthan State Mines and Mineral Limited	

Topic : Metals and its Ore

Metal	Common Ore& Formulae	Remarks
Iron (Fe)	Haematite Fe_2O_3 Magnetite Fe_3O_4 Goethite $FeO(OH)$ Limonite $FeO(OH).n(H_2O)$ Siderite $FeCO_3$ Pyrite Fes	Haematite Steak :Red to reddish brown Magnetite Steak :Black
Copper (Cu)	Chalcopyrite $CuFeS_2$ Chalcocite Cu_2S Covellite CuS Cuprite Cu_2O Malacite $Cu_2(O_3(OH)_2)$ Bornite Cu_5FeS_4 Azurite $Cu_3(CO_3)_2(OH)_2$ Malachite $Cu_2CO_3(OH)_2$ Chrysocollo $CuSiO_3.2H_2O$	
Aluminium (Al)	Bauxite Al_2O_3	
Lead (Pb)	Galena(Lead sulfide) PbS Cerussite $PbCO_3$ Anglesite $PbSO_4$	
Mercury (Quick silver)	Cinebar (Mercuric sulfide) HgS	
Zinc(Zn)	Sphalerite (Zinc Blende) (Zn,Fe)S Zincite ZnO_2 Smithsonite $ZnCO_3$	
Manganese(Mn)	Pyrolusite MnO_2 Braunite$Mn^{2+}Mn^{3+}{}_6(SiO_4)O_8$ Psilomelane $Ba,H_2O)_2Mn_5O_{10}$ Magnanite $MN_2O_3. H_2O$ Rhodochrosite ($MnCO_3$).	
Uraium(U)	Uraninite UO_2 Pitchblende $UO_3. U_2O_5$	
Tungsten(W)	Wolframite (FeMn)WO_4 Scheelite(calcium tungstate) $CaWO_4$	
Tin (Sn)	Cassiterite SnO_2	
Titanium (Ti)	Ilmenite $FeTiO_3$ Rutile TiO_2	
Silver (Ag)	Argentite (Silver glance)Ag_2S	
Chromium (Cr)	Chromite$FeCr_2O_4$	
Antimony (Sb)	Stibnite Sb_2S_3	

By Volume

N_2 → 79.04%
O_2 → 20.93
CO_2 → 0.03%

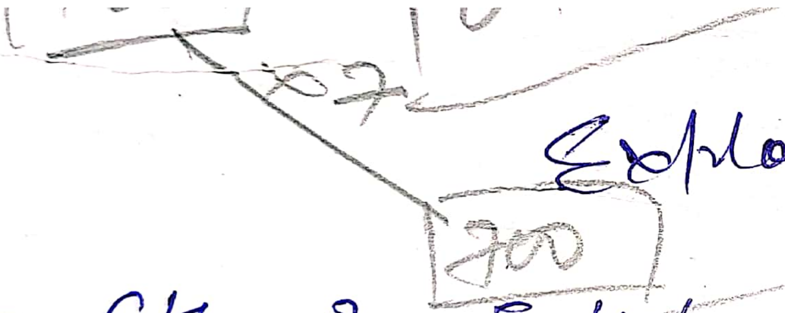
By Weight

N_2 → 76.81%
O_2 → 23.15%
CO_2 → 0.04%

Permissible limit of gases

(0.55) CH_4 → 1.25% anywhere, 0.75% return से अधिक नहीं
CO → 50 ppm (0.97)
(1.5) CO_2 → 0.5% से अधिक नहीं
(1.1) O_2 → 19% से कम नहीं
(2.2) SO_2 → 5 ppm
(1.18) H_2S → 10 ppm
(1.59) NO_x → 5 ppm

N_2 → 0.97 sp. gravity
H_2 → 0.069 specific gravity



Explosive limits

CH_4 → 5.4% to 14.8%

CO → 12.5 to ~~75~~ 74%

H_2 → 4 to 75 %

~~SO_2 →~~

H_2S → 4.3 to 45.

Appendix–17

Maximum velocity of Air

DGMS Cir.42/1974

Locality	Max. velocity of air m/sec
Fan drift	15
Ventilation shaft not provided with winding equipment	15
Ventilation shaft where manwinding is not carried out	12
Shaft used for manwinding	8
Conveyor roads, loading points, transfer points	4
Working places of development & depillaring areas including longwall face	4
Other roadway	6

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Appendix–13

DUST :

A number of material hazardous to health are present at the work place in the form of aerosols i.e. suspensions of solid or liquid particles in air. Dust is generally understood to be an aerosol of solid particles of size 0.1µm and above. Most of the dusts contain wide range of sizes. Dust is typically measured in micro meter (µm commonly known as microns) coal or rock dust can range for over 100 µm to less than 2 µm.

Inhalable Dust :

It is the fraction of airborne dust that enters the nose and mouth during breathing and deposited in the respiratory tract.

Respirable Dust :

It is the fraction of inhable dust that penetrates into the gas exchange region of the lungs. It is mostly in the size fraction of 0.1µm to 10 µm.

D.G.M.S Cir. Tech. 1/2010

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Appendix–14

In every gassy seam of the 2nd or 3rd degree and only development workings of 1st degree (where some special condition exists) stone dust barriers shall be provided.

Reg 146 (1) of CMR-2017

If any dispute arises as to whether stone dust barriers or other alternative precautionary measures are required to be provided in any part of a gassy seam of the 1st degree or not, the case shall be referred to the Chief Inspector who shall decide the same:

Reg 146 (3) of CMR-2017

Normally under following circumstances stone dust barriers shall be provided in the development workings of gassy seam of 1st degree:-

a. Where any working lying with 30 m of any fault plane having a throw equal to or more than the thickness of the seam or throw of fault is unknown.
b. Seam is geologically disturbed.
c. If regular borehole samples collected and any time 4% or more inflammable gas is found.
d. Due to highly mechanization rate of face advance is very fast so as to give rise to the possibility of emission of inflammable gases in dangerous quantity.

*****

Appendix–15

The aggregate charge in any shot to be fired in coal in u/g mines shall not be exceeded than permissible maximum charge, as the Chief Inspector may by a notification in official gazette, lay down for the kind of permitted explosives :

Reg.199(3) of CMR 2017

The details of maximum permissible charge in last notification is a follows :

Kind of explosive	Degree of Gassiness	Type of blasting	Max. Permissible Charge
P1	I	Cut face	794 g
P3	I, II or III	Cut face	1000 g
P5	I	Off the solid	1000 g
P5	II or III	Off the solid	565 g

It may vary time to time for different kinds of explosives.

****

Appendix–13

DUST :

A number of material hazardous to health are present at the work place in the form of aerosols i.e. suspensions of solid or liquid particles in air. Dust is generally understood to be an aerosol of solid particles of size 0.1µm and above. Most of the dusts contain wide range of sizes. Dust is typically measured in micro meter (µm commonly known as microns) coal or rock dust can range for over 100 µm to less than 2 µm.

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D.G.M.S Cir. Tech. 1/2010

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Appendix– 10

Test procedure for brakes & steering of dumper and trucks

(cir. tech 4/2012)

Test procedure – Service Brake:

a. Fasten the seat belt.
b. Move the machine to dry level surface.
c. Check the area around the machine.
d. Make sure that machine is clear from obstacles.
e. Start the engine and build air pressure up to cut off point.
f. Apply the service brake while keeping all other brakes off and move the transmission selector lever to first range forward.
g. Accelerate the engine RPM to 1400 and maintain it for a few seconds.

Desired result:- Machine should not move

Test procedure – Retard brake

a. Fasten the seat belt.
b. Move the machine to dry level surface.
c. Check the area around the machine.
d. Make sure that machine is clear from obstacles.
e. Start the engine and build air pressure up to cut off point.
f. Apply the retard brake while keeping all other brakes off and move the transmission selector lever to first range forward.
g. Accelerate the engine RPM to 1300 and maintain it for a few seconds.

Desired result: Machine should not move

Test procedure – Dump and Parking brake

a. Fasten the seat belt.
b. Move the machine to dry level surface.
c. Check the area around the machine.
d. Make sure that machine is clear from obstacles.
e. Start the engine and build air pressure up to cut off point.
f. Apply the parking brake while keeping all other brakes off and move the transmission selector lever to first range forward.
g. Accelerate the engine RPM to 1200 and maintain it for a few seconds.

Desired result: Machine should not move. Parking brake is considered to be in good working condition and can be expected to hold a loaded dumper on gradient of 15% degree (15°) .

Test procedure – Steering

a. Fasten the seat belt.
b. Move the machine to dry level surface.
c. Check the area around the machine and ensure machine is clear from obstacles.
d. Start the engine and build air pressure up to cut off point.
e. Remove all brakes and keep gear in neutral.
f. Rotate the steering wheel and bring the tyres to an extreme end position.
g. Remove the hands from steering wheel.
h. Accelerate the engine RPM to 1000 .
i. Rotate the steering wheel and bring the tyres to other extreme end position. Repeat (g) & (h).

Desired result: Machine should not move: When the hand is removed from the steering wheel either the steering or the tyres shall not move on its own. If any movement is observed, it shall be concluded that the steering system needs checking and necessary repairs shall be carried out before putting the dumper into service.

In the interest of safety, it is desired that shift and daily testing of braking and steering system of dumpers by competent person/operators are carried out as above and records maintained to reduce the chances of accidents.

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Appendix– 5

Maximum manwinding speed as per the instruction given by the DGMS on 10.09.1959

Depth of Shaft	Maximum rope speed during man winding
Up to 100 m	2m/sec
101m - 300 m	4 m/sec
301m - 500 m	5.5 m/sec
501m - 700 m	7 m/sec
701 m - 1000 m	8 m/sec
1001 m - 1500 m	10 m/sec
Above 1500	12 m/sec

Manwinding speed in sinking shaft

Depth of Shaft	Maximum rope speed during man winding
Up to 150 m (no guides are required)	1.5 m/sec
151m - 500 m	2.5 m/sec
Above 500 m	3 m/sec

*****

SCHEDULE - VIII

See rule 32 (3)

Code of signals

A. Between members of rescue team.

One hoot - "Distress" of Help wanted (If no answer given to call, "Distress" to be understood)
Two hoots - Halt
Three hoots - Retire
Four hoots - Advance
Five hoots - To call attention

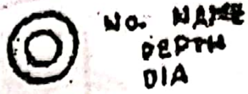
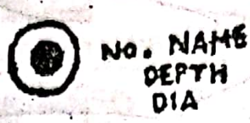
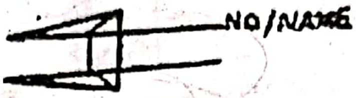
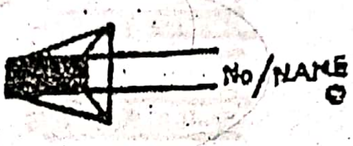
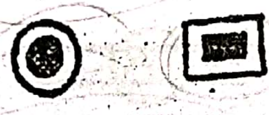
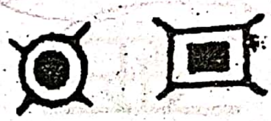
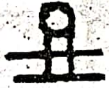
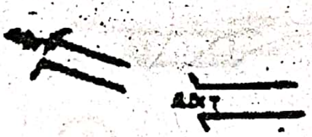
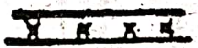
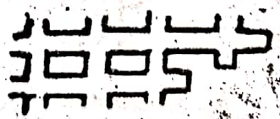
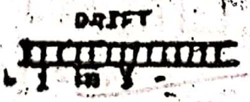
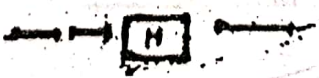
B. Botween tube apparatus operator and user,

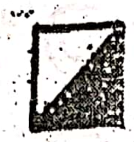
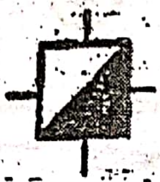
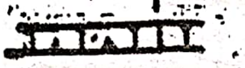
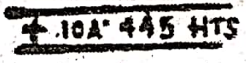
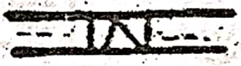
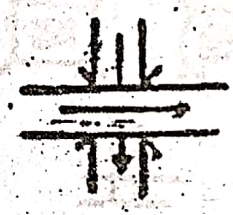
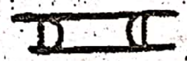
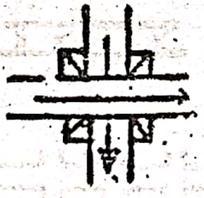
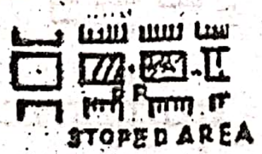
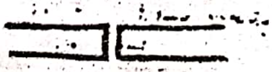
One tug - More air required
Two tugs - Give less air
Three tugs - Help me out

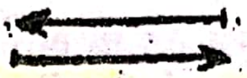
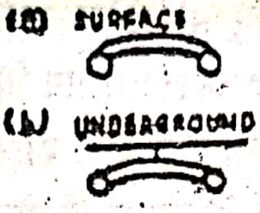
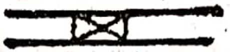
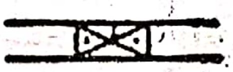
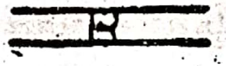
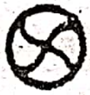
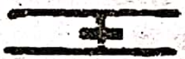
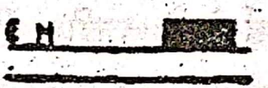
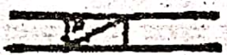
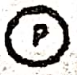
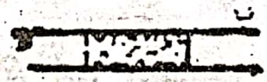
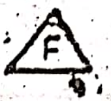
SCHEDULE—V

(See rule 18)

CODE OF SIGNS

Name	Symbol	Remarks
Shaft	 NO. NAME DEPTH DIA	For Coal Mines Only
Abandoned Shaft	 NO. NAME DEPTH DIA	-do-
Incline		-do-
Abandoned Incline		-do-
Shafts		For Metalliferous Mines
Abandoned Incline		-do-
Winzes		-do-
Adits		-do-
Cross Cut		-do-
Pillars and Galleries		In Burnt Sienna Showing Gradient in Black
Drift		
Water pipe line & Hydrants		In Blue (H Indicating Location Of Hydrant)

Name	Symbol	Remarks
Staple Shaft		In red should state the distances up and down to all insets
Abandoned Staple Shaft		In Red
Dyke or other intrusion		In green
Underground Spot Level		In blue
Water Dam		Letter 'W' to be written in blue
Air Crossing		Intake arrow in blue and return arrow in red
Doors		In red bow of 'D' is indicative of direction of opening of door
Explosion Proof Air Crossing		Intake arrow in blue and return arrow in red
Goaf or Stoped Area		
Brick/Stone or Concrete Ventilation Stopping		In red

Name	Symbol	Remarks
Direction of air current		Intake in blue Return in red
Telephone		
Fire dam seal or stopping		In red
Explosion proof stopping		In red
Regulator		In red
Auxiliary fan/ Booster fan		In red
Underground first aid station		Thick cross in red
Engine house or room		
Preparatory isolation stopping		In red
Pomping station		Letter 'P' to be written in blue
Sand stowing area		
Fire extinguisher/ fire station		In red

अनुसूची

[देखिए रेग्यूलेशन 64(2)]

नक्शे व सेक्शन बनाने के लिए निर्धारित चिन्ह

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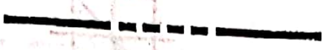
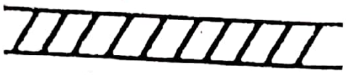
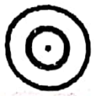
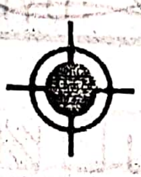
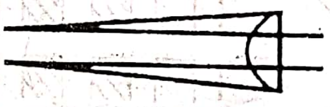
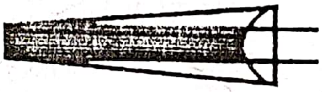
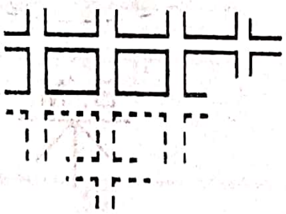
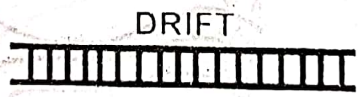
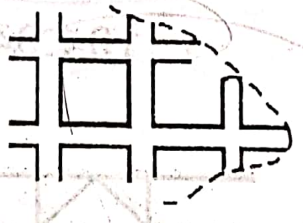
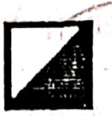
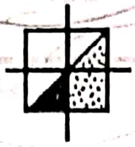
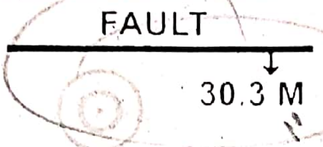
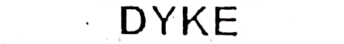
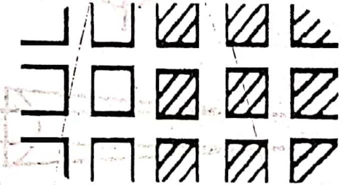
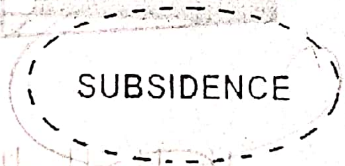
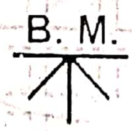
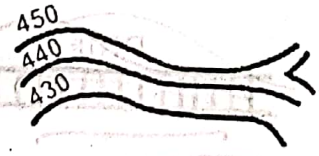
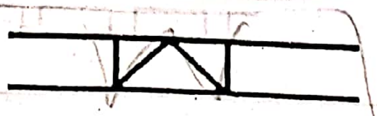
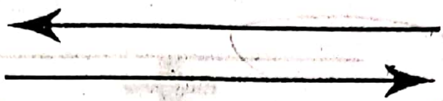
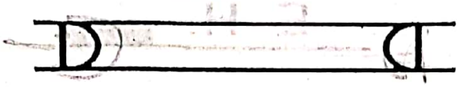
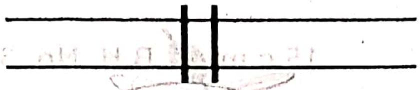
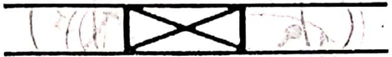
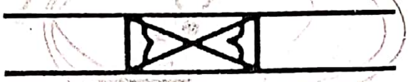
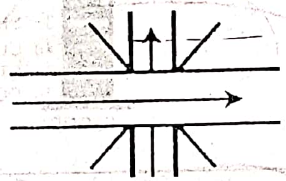
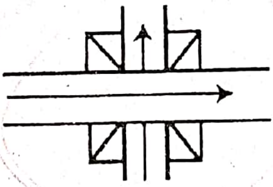
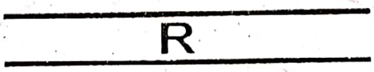
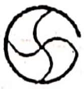
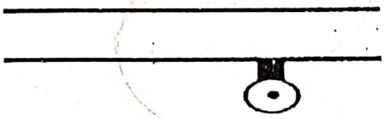
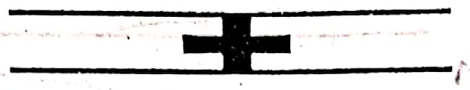
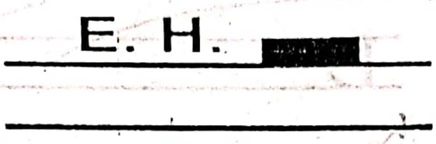
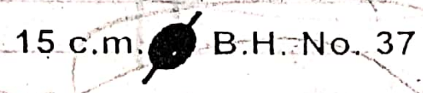
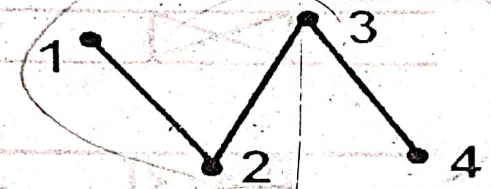
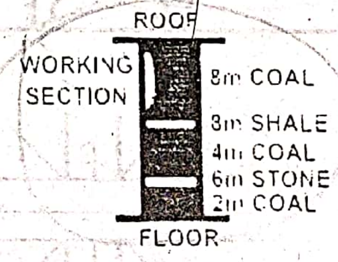
लीज़ ली हुई जमीन की सीमा		लाल रंग में
भूमिगत कोल बैरियर		हरे रंग में
शाफ्ट		
अबैंडंड शाफ्ट		
इंक्लाइन		
अबैंडंड इंक्लाहन		
पिलर और गैलरी		टूटी रेखाओं द्वारा दिखाई गैलरियों का सर्वे नहीं किया गया है और उनका विस्तार ठीक से मालूम नहीं है।
ड्रिफ्ट		बर्न्ट सियना (Burnt Sienna) ड्रिफ्ट का ढाल काले रंग में
त्रैमासिक सवे लाइन		

नाम	संकेत चिन्ह	रिमार्क
स्टैपिल शाफ्ट (टोवाली चानक)		लाल रंग में (सब इन्सेट की दूरी दिखाई जाएगी)
अबैंडंड स्टैपिल शॉफ्ट (बंद टोवाली चानक)		लाल रंग में
फाल्ट		लाल रंग में (थ्रो की दिशा व परिमाण दिखाते हुए)
डाइक या अन्य अंतर्वेध		हरे रंग में
गोफ		
धंसी जमीन	 SUBSIDENCE	लाल रंग में
बेंच मार्क		
सरफेस कन्टूर		(बर्न्ट सियना) रंग में
भूमिगत स्पॉट लेवल	+ 104.94	नीले रंग में
पानी का डैम		लाल रंग में

नाम	संकेत चिन्ह	रिमार्क
हवा की धारा की दिशा		इन्टेक नीले रंग में रिटर्न लाल रंग में
फाटक		लाल रंग में
ईंट, पत्थर या कंक्रीट की वेंटीलेशन स्टॉपिंग		लाल रंग में
फायर डैम, सील या स्टॉपिंग		लाल रंग में
विस्फोट रोधी स्टॉपिंग		लाल रंग में
एअर क्रॉसिंग		
विस्फोट रोधी एअर क्रॉसिंग		
रेग्यूलेटर		लाल रंग में
आक्जलेरी पंखा		लाल रंग में
टेलीफोन		लाल रंग में

नाम	संकेत चिन्ह	रिमार्क
भूमिगत फर्स्ट एड स्टेशन		मोटा लाल चिन्ह
इंजन रूम		
बोरहोल	 15 c.m. B.H. No. 37	बोरहोल नंबर व व्यास दिखाया जाए
सर्वे लाइन व स्टेशन		लाल रंग में
सीम का सेक्शन	 ROOF WORKING SECTION 8m COAL 3m SHALE 4m COAL 6m STONE 2m COAL FLOOR	

कार्य में घंटों की सीमा का सार

Sec. 30	सरफेस में	कार्य के घंटे : सप्ताह में अधिकतम 48 घंटे : एक दिन में अधिकतम 9 घंटे कार्य समय का विस्तार : अधिकतम 12 घंटे (रेस्ट इंटरवल सहित)
Sec. 31	भूमिगत भाग में	कार्य के घंटे : सप्ताह में अधिकतम 48 घंटे : एक दिन में अधिकतम 8 घंटे कार्य समय का विस्तार : अधिकतम 8 घंटे
Sec. 32	नाइट शिफ्ट	साप्ताहिक विश्राम : नाइट शिफ्ट खत्म होने के बाद 24 घंटे
Sec. 34		किसी भी ऐसे व्यक्ति को काम पर नहीं लगाया जाएगा, जिसने पिछले 12 घंटों में किसी अन्य खान में काम किया हो
Sec. 35	दैनिक कार्य घंटे	ओवरटाइम सहित : अधिकतम 10 घंटे छूट : इमरजेंसी में, : जब तकनीकी कारणों से कार्य लगातार चालू रखना जरुरी है
Sec. 46	महिलाओं का कार्य समय	● किसी भी महिला को भूमिगत भाग में नियोजित नहीं किया जाएगा। ● सरफेस पर : 6AM से 7PM के बीच समय को छोड़कर अन्य समय नहीं लगाया जाएगा : एक दिन काम समाप्त होने व अगले दिन शुरू करने का समयांतर 11 घंटे से कम नहीं होगा। : केंद्रीय सरकार कुछ अवस्था में छूट दे सकती है, परंतु किसी भी हालत में महिलाओं को 10PM से 5AM के बीच में नहीं लगाया जाएगा। : यह नियम पिट हेड बाथ, क्रेच, कैंटीन में तथा धाय/नर्स पर लागू नहीं होता। केंद्रीय सरकार द्वारा छूट : कोयला या सैंड वैगन लोडिंग/अनलोडिंग; स्क्रीनिंग/वाशिंग प्लांट में कार्य; सरफेस पर आग बुझाने व आइसोलेशन के कार्य

नोट— सेक्शन 30, 31, 34 व 35 की उपरोक्त पाबंदियां सुपरवाइजर, मैनेजमेंट व गोपनीयता की हैसियत में काम करनेवालों पर लागू नहीं होंगी। (Sec. 39)

● दंड प्रावधानों का सार

सेक्शन	अपराध	दंड (जेल और जुर्माना)
63	(1) इंस्पेक्टर के कार्य में बाधा डालना या न्यायसंगत सुविधा न देना	3 माह या 500 रु० या दोनों
	(2) कोई दस्तावेज पेस करने से मना करना, या किसी व्यक्ति को इंस्पेक्टर के सामने पेश होने से रोकना, या उसके द्वारा पूछताछ में बाधा डालना।	300 रु०
64	सर्टिफिकेट की जालसाजी, जाली सर्टिफिकेट काम में लेना, सर्टिफिकेट प्राप्त करने के लिए झूठी घोषणा; प्लान, सेक्शन या रिकार्ड में जालसाजी; जाली प्लान, सेक्शन या रिकार्ड पेश करना; गलत नक्शे, विवरणी नोटिस, रिकार्ड या रिपोर्ट बनाना या देना	1000 3 माह या ~~300~~ रु० या दोनों
65	झूठा योग्यता सर्टिफिकेट काम में लेना या दूसरे को उपयोग के लिए देना	1 माह या 200 रु० या दोनों
66	नक्शे, रिटर्न, नोटिस, रिपोर्ट देने में चूक	1000 रु०
67	श्रमिकों के नियोजन संबंधी उल्लंघन	3 माह या 1000 रु० दोनों
68	18 वर्ष से कम आयु के व्यक्ति का नियोजन	500 रु०
69	मैनेजर बहाल न करना	3 माह या 2500 रु० या दोनों
70	—ऐक्सीडेन्ट की रिपोर्ट न देना या नोटिस बोर्ड पर न लगाना या —ऐक्सीडेन्ट के रजिस्टर न रखना और रिपोर्ट न देना	3 माह या 500 रु० दोनों
72A	कुछ रेग्यूलेशंस का उल्लंखन	6 माह या 2000 रु० या दोनों
72B	सेक्शन 22 या 22A का उल्लंघन	2 वर्ष और 5000 रु०
72C	उल्लंघन के फलस्वरूप किसी व्यक्ति की	
	मृत्यु	2 वर्ष या 5000 रु० या दोनों
	घातक चोट	1 वर्ष या 3000 रु० या दोनों
	अन्य चोट या खतरा	3 माह या 1000 रु० या दोनों
73	कानून का उल्लंघन जिसके लिए दंड ऐक्ट में नहीं लिखा है	3 माह या 1000 रु० या दोनों
74	2 वर्ष के भीतर दुबारा वही जुर्म	पहले दंड का दुगना